SERVICE MANUAL

AIRCONDITIONER
FLOOR STANDING TYPE

Model:

MFGA-60ARDN1-QC2

CONTENTS

1. Safety Precautions

1.1 Precaution

To prevent injury to the user or other people and property damage, the following instructions must be followed.
Incorrect operation due to ignoring instruction will cause harm or damage.

Before service unit, be sure to read this service manual at first.

1.2 Installation

For electrical work, contact the dealer, seller, a qualified electrician, or an Authorized service center.
Do not disassemble or repair the product by yourself.
Sharp edges could cause injury, be especially careful of the case edges and the fins on the condenser and evaporator.
Be sure the installation area does not deteriorate with age.
Take care to ensure that power cable could not be pulled out or damaged during operation.
Do not place anything on the power cable.
Do not plug or unplug the power supply plug during operation.
Do not store or use flammable gas or combustible near the product.
When flammable gas leaks, turn off the gas and open a window for ventilation before turn the product on.
If strange sounds, or small or smoke comes from product. Turn the breaker off or disconnect the power supply cable as soon as possible.
When the product is soaked (flooded or submerged), contact an Authorized service center.
Be caution that water could not enter the product.
Turn the main power off when cleaning or maintaining the product.
When the product is not be used for a long time, disconnect the power supply plug or turn off the breaker.

1.3 Caution

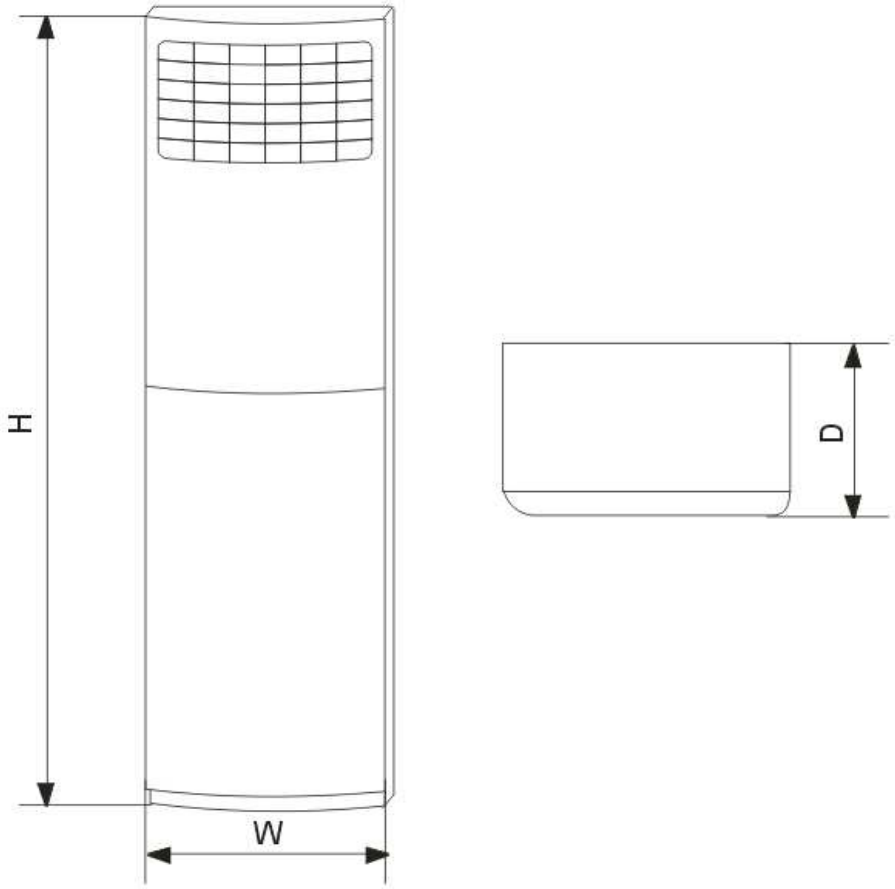
Always check for gas (refrigerant) leakage after installation or repair of product.
Install the drain hose to ensure that water is drained away properly.
Keep level even when installing the product.
Do not install the product where the noise or hot air from the outdoor unit could damage the neighborhoods.
Use two or more people to lift and transport the product.
Do not install the product where it will be exposed to sea wind (salt spray) directly.

1.4 Operational

Do not expose the skin directly to cool air for long periods of time. (Do not sit in the draft).
Do not use the product for special purposes, such as preserving foods, works of art, etc. It is a consumer air conditioner, not a precision refrigerant system.
Do not block the inlet or outlet of air flow.
Use a soft cloth to clean. Do not use harsh detergents, solvents, etc.
Do not touch the metal parts of the product when removing the air filter. They are very sharp.
Do not step on pr put anything on the product. (outdoor units)
Always insert the filter securely. Clean the filter every two weeks or more often if necessary.
Do not insert hands or other object through air inlet or outlet while the product is operated.
Do not drink the water drained from the product.
Use a firm stool or ladder when cleaning or maintaining the product.
Replace the all batteries in the remote control with new ones of the same type. Do not mix old and mew batteries or different types of batteries.
Do not recharge or disassemble the batteries. Do not dispose of batteries in a fire.
If the liquid from the batteries gets onto your skin or clothes, wash it well with clean water. Do not use the remote of the batteries have leaked.

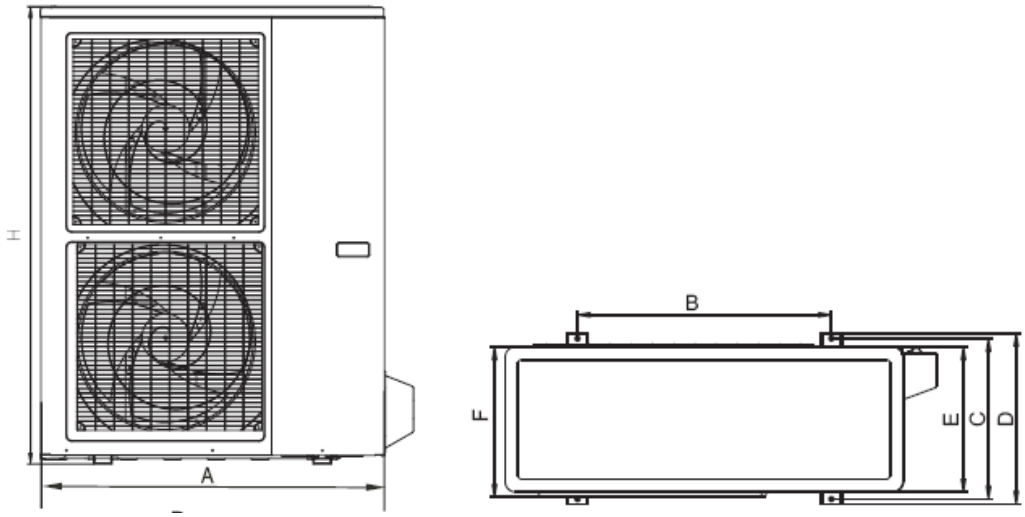
2. Dimension

2.1 Indoor Unit



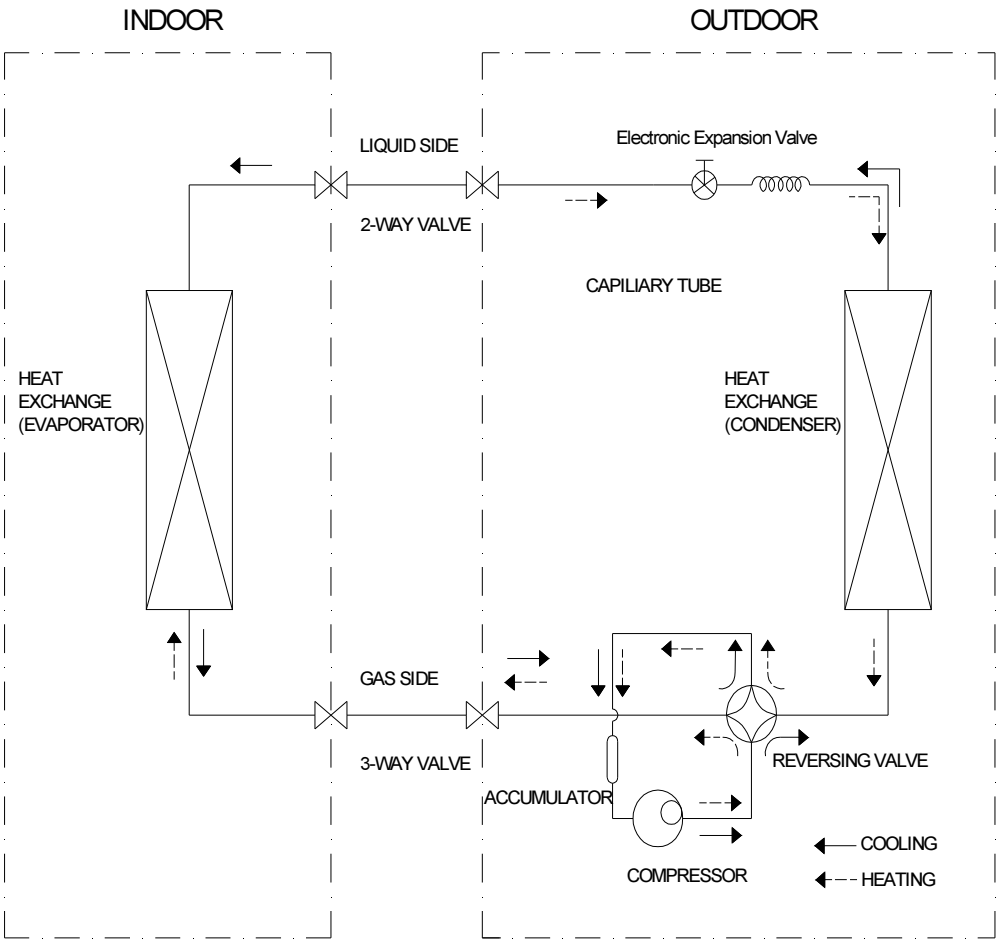
Dimension / Mode	W(mm)	D(mm)	H(mm)
MFGA-60ARDN1-QC2	610	390	1925

2.2 Outdoor Unit



MODEL	A	B	C	D	E	F	H
MOU-60HDN1-R	940	600	376	400	340	360	1245

3. Refrigerant cycle diagram



4 . Wiring diagram

MFGA-60ARDN1-QC2

Indoor Unit

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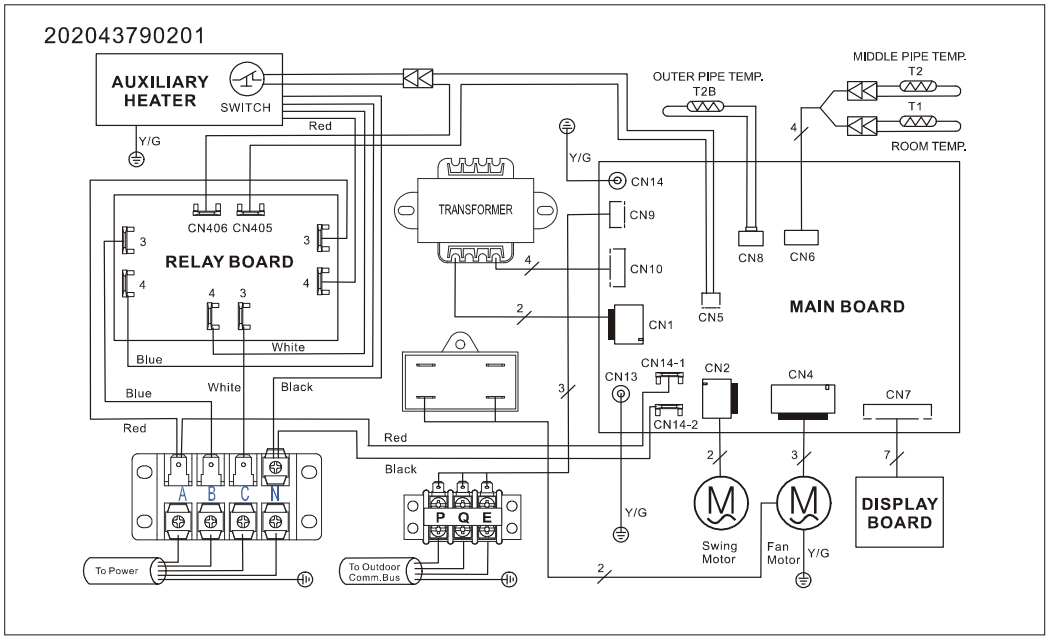
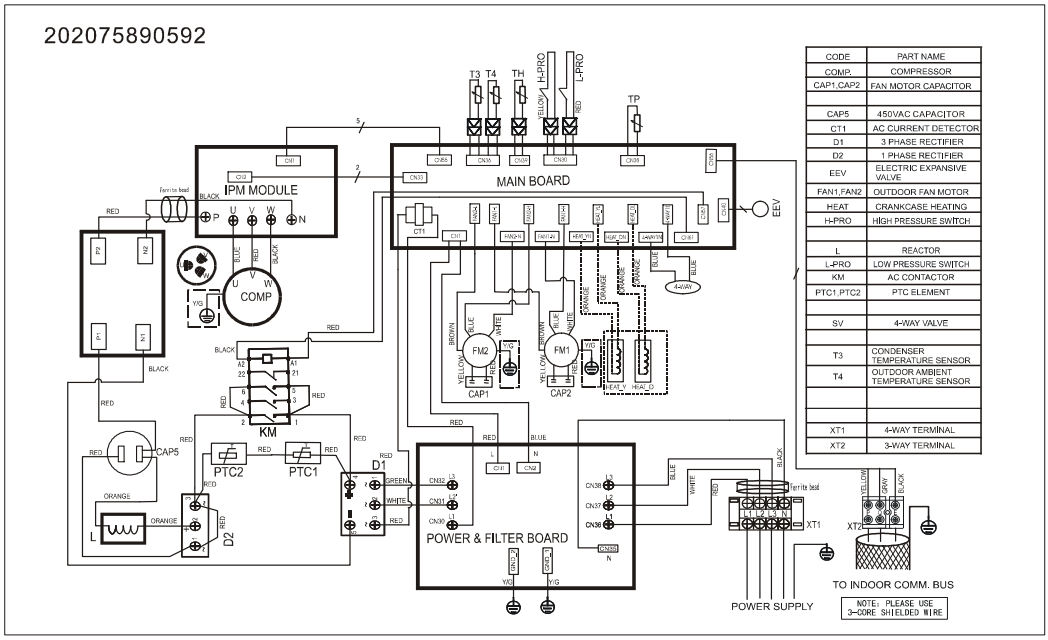


Outdoor Unit

202075890592



CODE	PART NAME
COMP.	COMPRESSOR
CAP1,CAP2	FAN MOTOR CAPACITOR
CAP5	450VAC CAPACITOR
CT1	AC CURRENT DETECTOR
D1	3 PHASE RECTIFIER
D2	1 PHASE RECTIFIER
EEV	ELECTRIC EXPANSIVE VALVE
FAN1,FAN2	OUTDOOR FAN MOTOR
HEAT	CRANKCASE HEATING
H-PRO	HIGH PRESSURE SWITCH
L	REACTOR
L-PRO	LOW PRESSURE SWITCH
KM	AC CONTACTOR
PTC1,PTC2	PTC ELEMENT
SV	4-WAY VALVE
T3	CONDENSER TEMPERATURE SENSOR
T4	OUTDOOR AMBIENT TEMPERATURE SENSOR
XT1	4-WAY TERMINAL
XT2	3-WAY TERMINAL

5 · Installation details

5.1 Installation place

5.1.1 Indoor Unit

a. A place which provides the spaces around the indoor unit as required above in the diagram.

b. A place where is no obstacle near the inlet and outlet area.

c. A place which can bear the weight of the indoor unit.

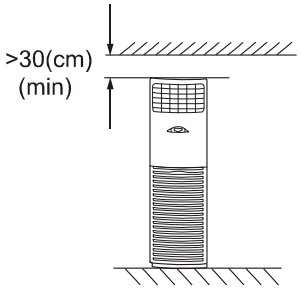
d. A place which allows the air filter to be removed downward.

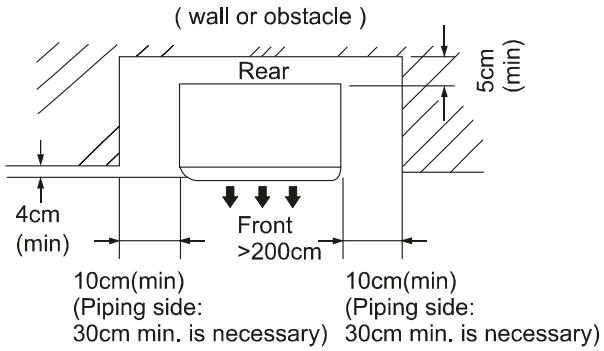
e. A place where the reception range is not exposed to direct sunlight.

f. In the center of the room where possible.

5.1.1.1 Please stand the unit in hard and flat ground;

Please reserve space for installation and maintenance.





5.1.1.2 Please check the elevation difference between the indoor unit and the outdoor unit, the length of the refrigerant pipe, and the curved places (bend) of the pipe are no more than the following numbers:

Elevation difference: no more than 10M (if the elevation difference between indoor and outdoor unit is more than 10 meters, it is recommended that the indoor unit be located higher than the outdoor unit.)

Pipe length: no more than 20M.

Bends: no more than 3 places.

5.1.2 Outdoor Unit

5.1.2.1 Before installing the outdoor unit, you should:

a). Select a place where no direct sunlight or other heat-radioactivity may reach. A sunshade is needed if it is unavoidable.

b). Select a place that is easy to connect indoor unit's pipe and electric wires.

c). Avoid a place where combustible gas may leak or stay.

d). Keep it in mind that water may drain out of the outdoor unit while in "Heat" mode.

Caution:

Installation in the following places may cause trouble. If it is unavoidable to use in such places, please consult with the dealer.

a. A place full of machine oil.

b. A saline place such as coast.

c. Hot-spring resort.

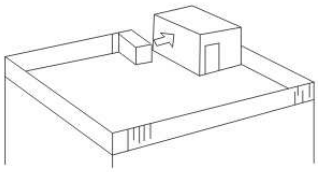
d. A place full of sulfide gas.

e. A place where there are high frequency machines such as wireless installation, welding machine, medical facility.

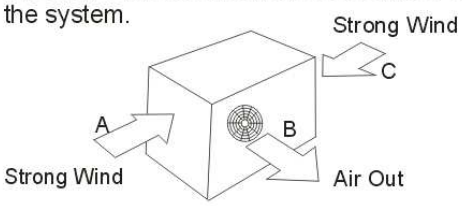
f. A place of special environmental conditions.

5.1.2.2 If the outdoor unit is to be installed on a roof or where no constructions are around, you should avoid hard wind blows directly to the air outlet, because it may cause trouble for air-flow shortage.

For example:
Let the air outlet face a wall (if there is one) with a distance about 300 centimeters between them.



Try to make the air outlet vertical to wind direction if it is known in the season you use the system.

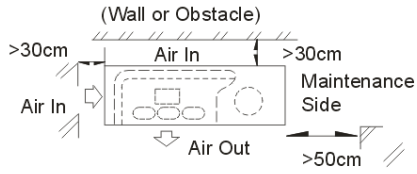


In directions Ⓐ, Ⓑ , Ⓒ, leave open two of the three directions.

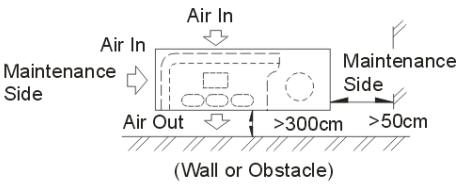
5.1.2.3 Reserve enough space for installation, maintenance and unit-functioning.

Remove as many obstacles as possible nearby.

When the air-in surface is facing a wall



When the air-out surface is facing a wall



5.2 Installing

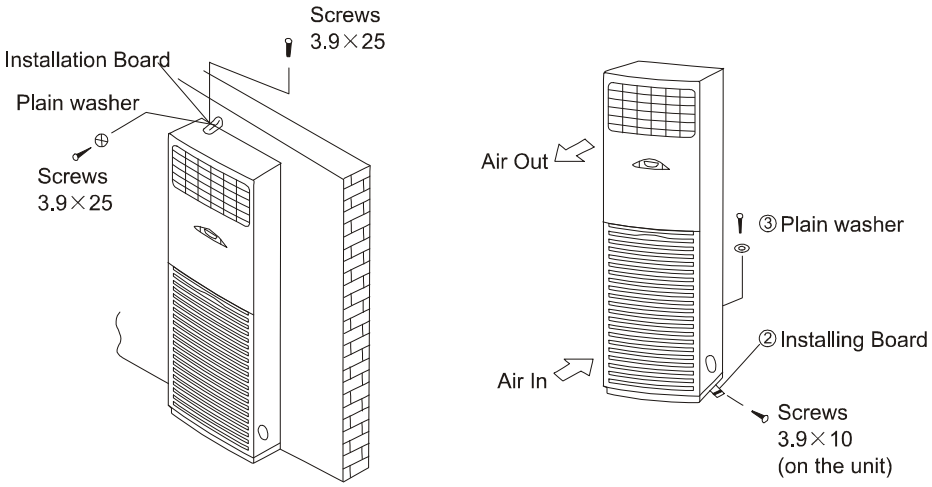
5.2.1 Indoor Unit:

1. Anti-falling;

To prevent the indoor unit from falling, you must:

a. Pay full attention to the unit because its long outer shape makes it easy to fall;

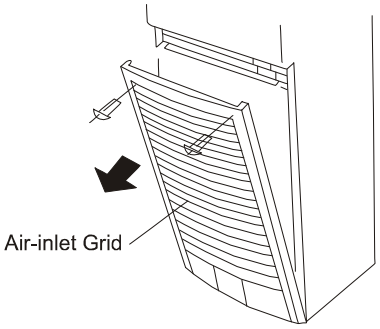
b. Firmly fix the unit to the wall or in the ground to avoid accidental falling.



2. Dismounting the air-inlet grid

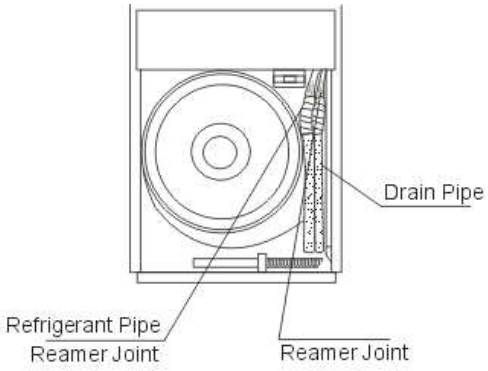
Please take off the air-inlet grid before connecting the pipes/wires.

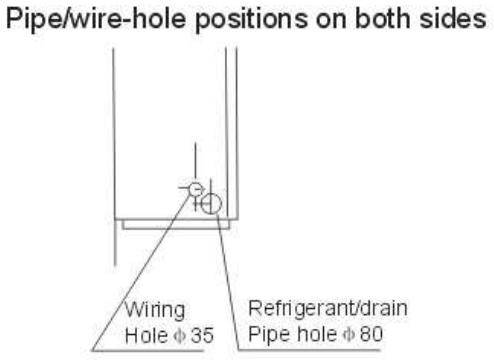
Pull down the two knobs on the grid, take off the two screws, then the air-inlet grid goes free.



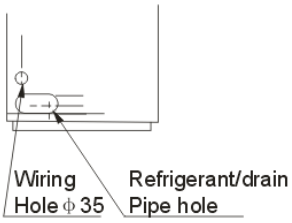
3. Take the Pipe Clip off before connecting the pipes and wiring; fit it when these finished.

Use accessories to connect the pipes/wires on both sides and back side.

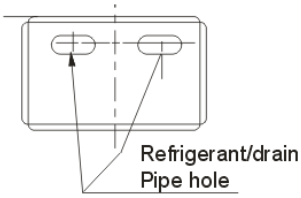




Pipe/wire-hole position on back side

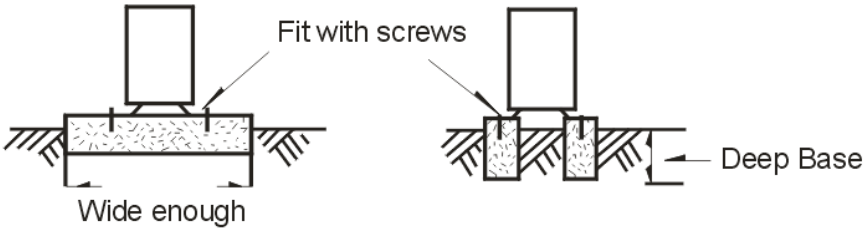


Pipe/wire-hole position on the bottom

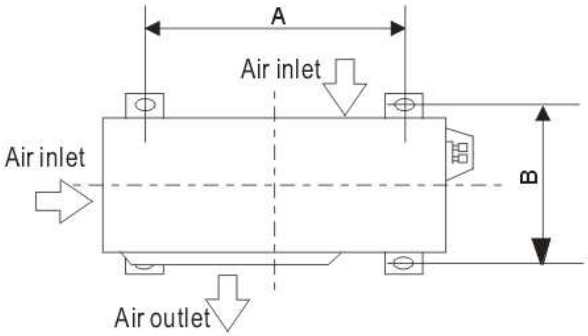


5.2.2 Outdoor Unit:

1. Ship the a/c to the installation place originally packed;
2. Be careful while hanging the unit because the center of gravity of the unit is not centralized;
3. Do not make the angle of inclination more than 45 degrees while shipping;(Avoid horizontal storage)
4. Be sure the electric insulation work is well done if installed on metal ceiling / wall.



5. Fix the unit feet with bolts (M10/M8). Be sure the unit is fixed strongly enough to against blast or earthquake.
6. Make a concrete basement to the unit by the following references.



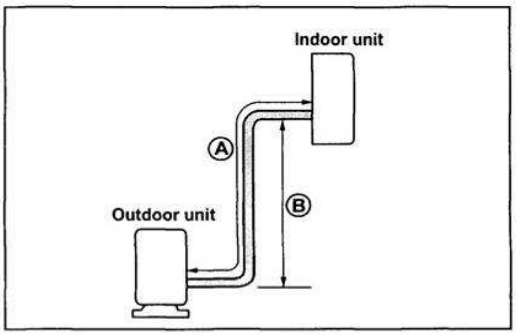
For the value of A and B, please refer to the dimension table.

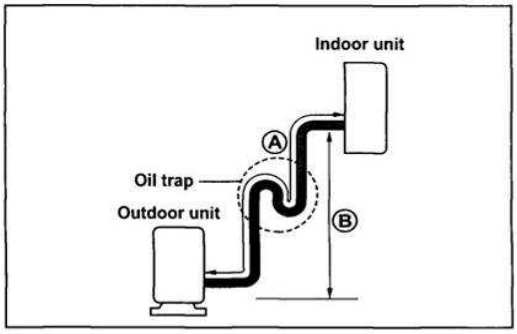
5.3 Refrigerant pipe connection

5.3.1 Pipe length and the elevation

The correct refrigerant quantity filled in the 5-meter-long pipe of the outdoor unit is marked on the Product Data Plate. If you have to use longer pipe for every meter plus pipe, the refrigerant should be added according to the following calculation.

Capacity Btu/h	Pipe size		Standard length (m)	Max. Elevation B (m)	Max. Length A (m)	Additional refrigerant (g/m)
	Gas	Liquid				
MFGA-60ARDN1-QC2	5/8'' (Φ16.0)	3/8'' (Φ9.52)	5	15	30	40





Caution:

Capacity is base on standard length and maximum allowance length is base of reliability.

Oil trap should be installed per 5-7 meters.

5.3.2 Piping connection

5.3.2.1 Connecting Of Refrigerant Pipe

a) Only the correctly installing of indoor and outdoor unit done, can the refrigerant pipe be connected.

b) The cut-off valves are completely close before ex-work. Before connecting the refrigerant pipe, be careful to check whether the valves are completely close.

c) The connecting procedure of refrigerant pipe: first, unscrew the two valves on the outdoor unit and the pipe-jointing nut on the indoor unit(please keep them care fully). Please connect the refrigerant pipe according to the manual, the pipe-jointing nut should be screw tightly and no leakage. Note: you need two wrenches to make balance.

d) When the connecting of refrigerant pipe is finished, before power on the system, you

should vacuum the indoor unit through the maintenance port on the cut-off valves, or open the high-pressure valve, and exhaust the air through the maintenance port on the low-pressure valve(closed). It will take about ten seconds. Then screw tightly the maintenance port. (When supplement the refrigerant, fill through the maintenance port of the low-pressure valves on the outdoor unit).

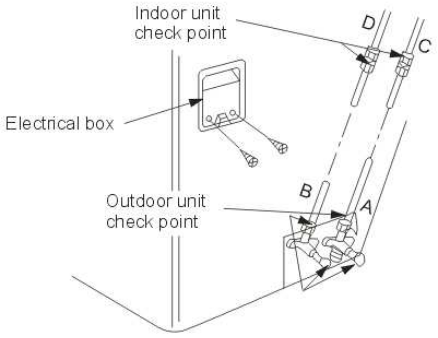
e) Open all the valves completely before power on the system, or it will be sick for low efficiency.

f) Gas leak check. Make sure no gas from connections with leak detector or soap water.

Caution:

A: Lo packed valve B: Hi packed valve

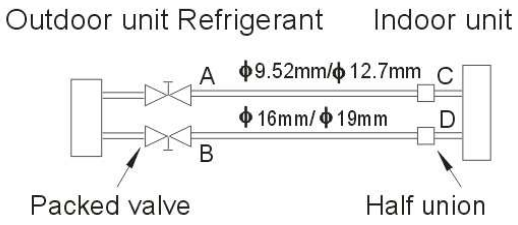
C and D are ends of indoor unit connection.

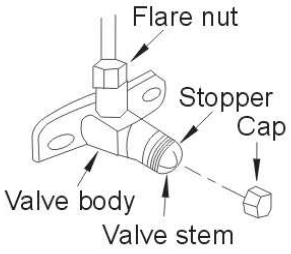


Caution in Handling the Packed Valve

a. Open the valve stem until it hits against the stopper. Do not try to open it further.

b. Securely tighten the valve stem cap with a spanner or the link.





Notes for the bendable pipe

a. The bendable pipe should be used on the indoor side;

b. Bend angel may not exceed 90 degrees;

c. The bend location should be made on the center of the pipe if possible, as for bend radius, the bigger the better;

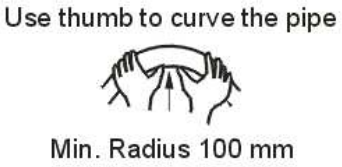
d. The bendable pipe may not be bent for more than 3 times.

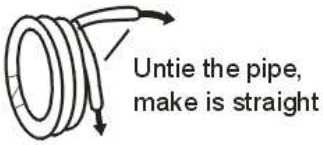
Bend the thin pipe

a. While bending, expose the pipe by cutting the concave gap on the bending heat-insulation pipe(roll it with soft band after bent).

b. To avoid pipe deformation, the radius is the bigger the better.

c. Use a pipe-bending device to make the compact bending pipe.





5.3.2.2 Using bronze pipe selling in market

Completely shut the cut-off valves of the outdoor unit (as ex-work status). After the refrigerant pipe has been connected with both the indoor and outdoor unit, let the air exhaust out from the maintenance gap on he low-pressure cut-off valves of the outdoor unit. Screw the nuts tightly on the maintenance gap after the air has been drained.

5.3.2.3 To make the refrigerant pipe unblocked completely

You should keep the cut-off valves of the outdoor unit completely open after you have finished the above steps (5.3.2.1 or 5.3.2.2)

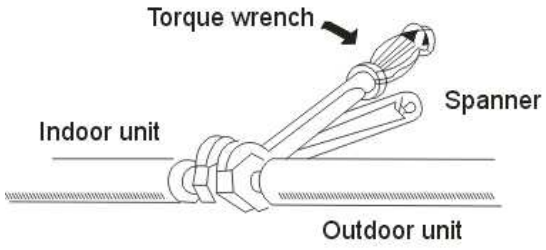
Note:

1.Before screwing the reamer nut, smear the pipe and the connecting surface with refrigerant oil;

2.Check and make sure there is no leakage by soap-water or leakage-checker after connecting;

3.Be sure the connecting joint on the indoor side is insulated.

4.Use two wrenches to connecting the pipes.



Outside diameter		Torque	Additional tightening torque
mm	**inch**	**N.cm**	**N.cm**
Φ9.52	3/8	2500	2600
Φ12.7	1/2	3500	3600
Φ16	5/8	4500	4700
Φ19	3/4	6500	6700

5.3.3 Installation for the first time

Air and moisture in the refrigerant system have undesirable effects as below:

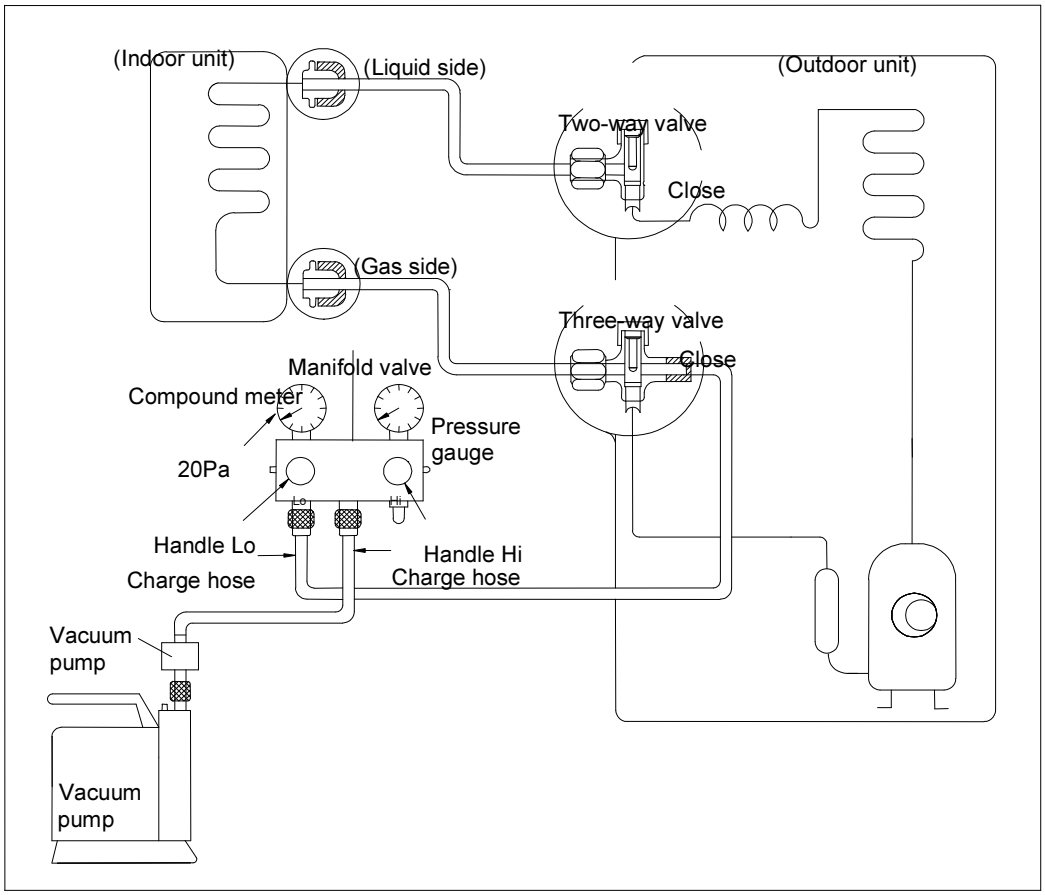
- Pressure in the system rises.
- Operating current rises.
- Cooling or heating efficiency drops.
- Moisture in the refrigerant circuit may freeze and block capillary tubing.
- Water may lead to corrosion of parts in the refrigerant system.

Therefore, the indoor units and the pipes between indoor and outdoor units must be leak tested and evacuated to remove gas and moisture from the system.

Gas leak check (Soap water method):

Apply soap water or a liquid neutral detergent on the indoor unit connections or outdoor unit connections by a soft brush to check for leakage of the connecting points of the piping. If bubbles come out, the pipes have leakage.

1. Air purging with vacuum pump



1) Completely tighten the flare nuts of the indoor and outdoor units, confirm that both the

2-way and 3-way valves are set to the closed position

2) Connect the charge hose with the push pin of handle lo to the 3-way valves gas service port..
3) Connect the charge hose of handle hi connection to the vacuum pump.
4) Fully open the handle Lo of the manifold valve.
5) Operate the vacuum pump to evacuate.
6) Make evacuation for 30 minutes and check whether the compound meter indicates -0.1Mpa. If the meter does not indicate -0.1Mpa after pumping 30 minutes, it should be pumped 20 minutes more. If the pressure can't achieve -0.1Mpa after pumping 50 minutes, please check if there are some leakage points.

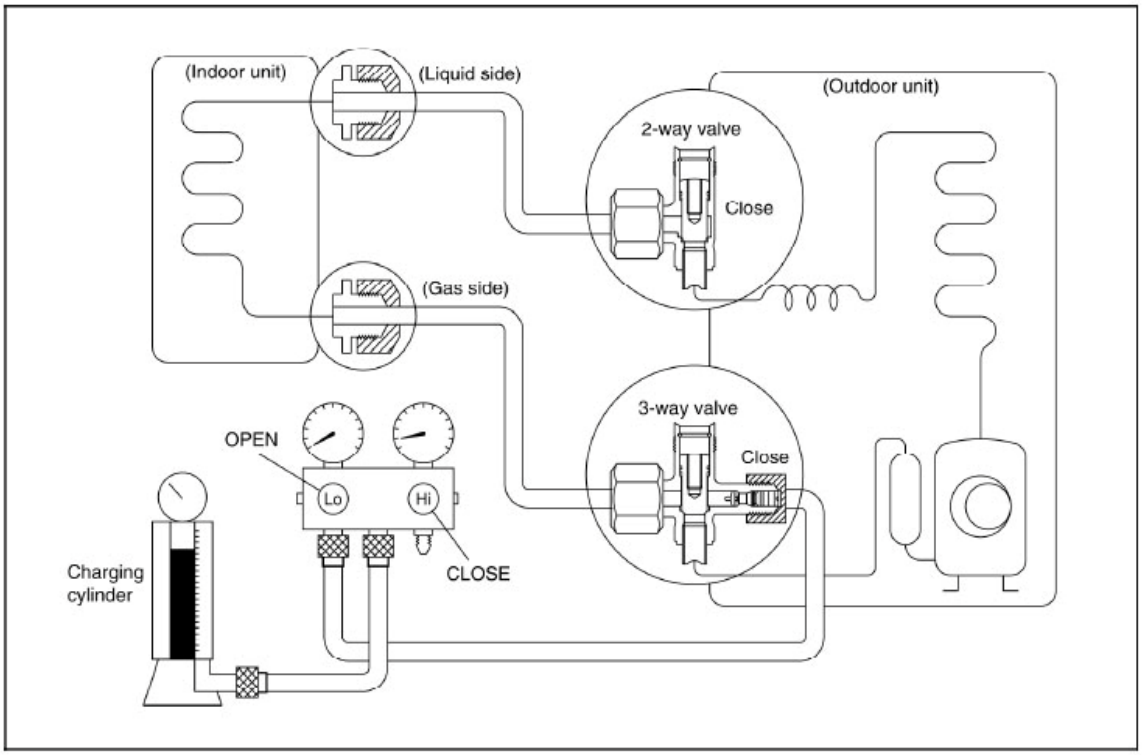
Fully close the handle Lo valve of the manifold valve and stop the operation of the vacuum pump. Confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).

7) Turn the flare nut of the 3-way valves about 45° counterclockwise for 6 or 7seconds after the gas

coming out, then tighten the flare nut again. Make sure the pressure display in the pressure indicator is a little higher than the atmosphere pressure. Then remove the charge hose from the 3 way valve.

8) Fully open the 2 way valve and 3 way valve and securely tighten the cap of the 3 way valve.

2. Air purging by refrigerant



Procedure:

1). Confirm that both the 2-way and 3-way valves are set to the closed position.

2). Connect the charge set and a charging cylinder to the service port of the 3-way valve.

3). Air purging

Open the valves on the charging cylinder and the charge set. Purge the air by loosening the flare nut on the 2-way valve approximately 45’ for 3 seconds then closing it for 1 minute; repeat 3 times.

After purging the air, use a torque wrench to tighten the flare nut on the 2-way valve.

4). Check the gas leakage

Check the flare connections for gas leakage.

5). Discharge the refrigerant

Close the valve on the charging cylinder and discharge the refrigerant by loosening the flare nut on the 2-way valve approximately 45’ until the gauge indicates 0.3 to 0.5 Mpa.

6). Disconnect the charge set and the charging cylinder, and set the 2-way and 3-way valves to the open position.

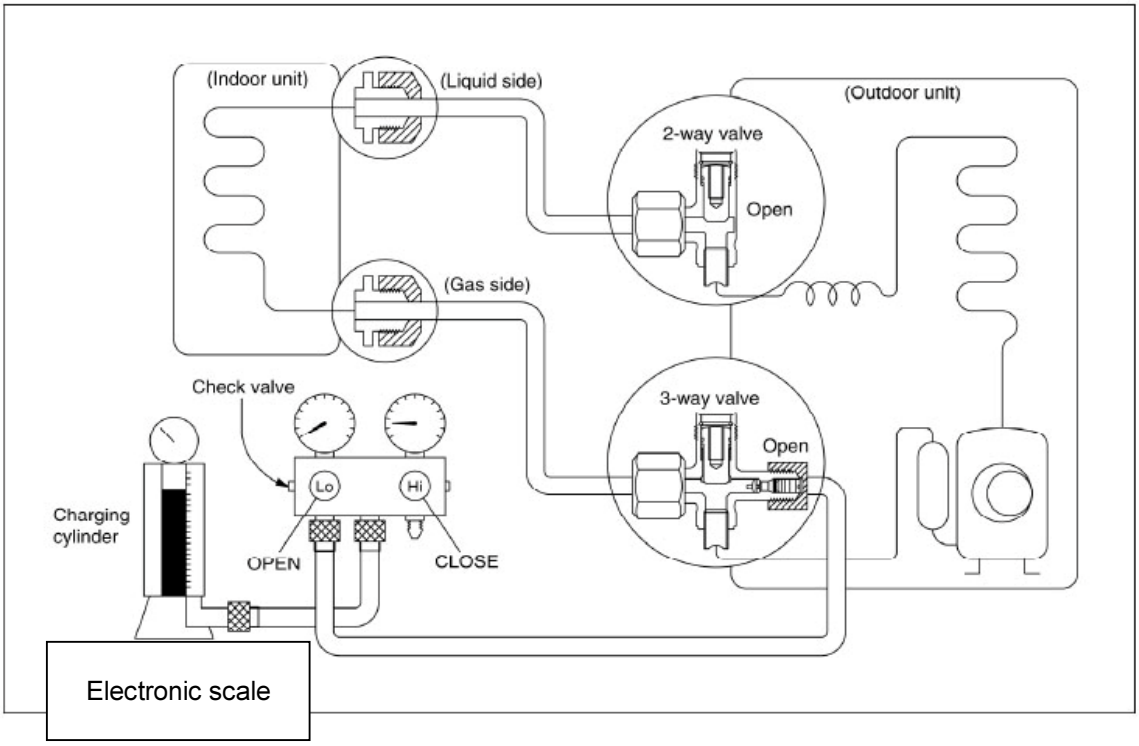
Be sure to use a hexagonal wrench to operate the valve stems.

7). Mount the valve stems nuts and the service port cap.

Be sure to use a torque wrench to tighten the service port cap to a torque 18N·m.

Be sure to check the gas leakage.

3. Adding the refrigerant if the pipe length >5m



Procedure:

1). Connect the charge hose to the charging cylinder, open the 2-way valve and the 3-way valve.

Connect the charge hose which you disconnected from the vacuum pump to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder bottom up to ensure the liquid charge.

2). Purge the air from the charge hose

Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).

3) Put the charging cylinder onto the electronic scale and record the weight.

4) Operate the air conditioner at the cooling mode.

5) Open the valves (Low side) on the charge set and charge the system with liquid refrigerant.

6).When the electronic scale displays the proper weight (refer to the table), disconnect the

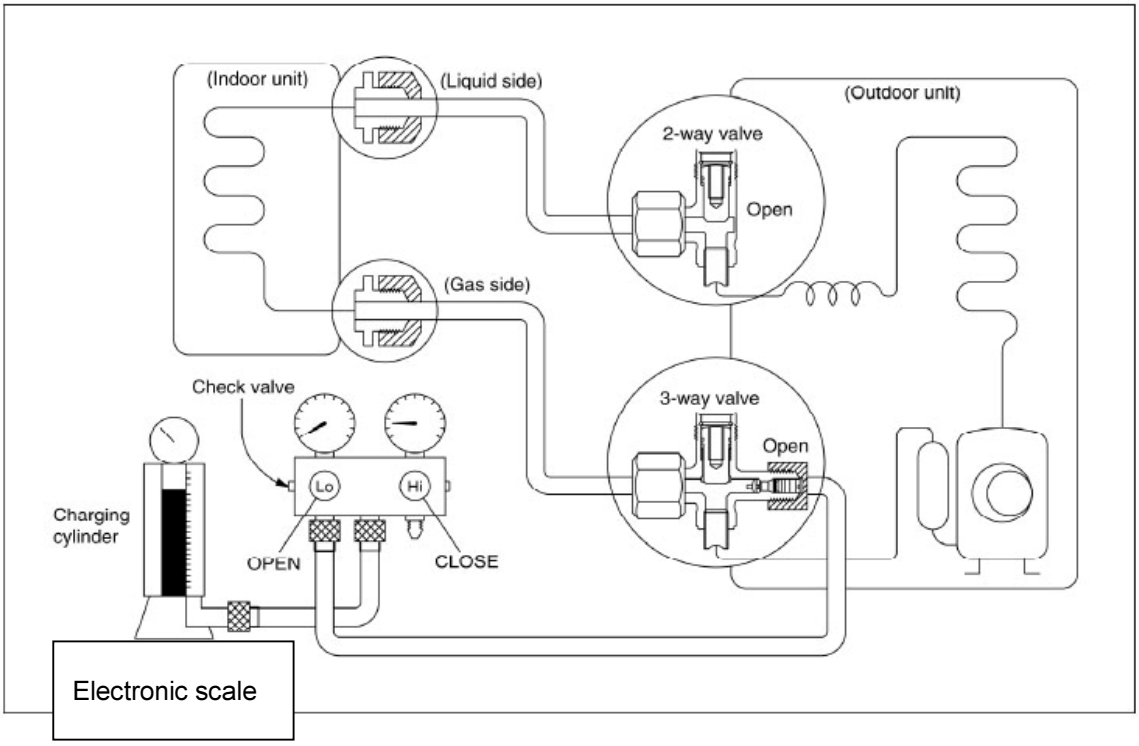
charge hose from the 3-way valve's service port immediately and turn off the air conditioner before disconnecting the hose.

7). Mount the valve stem caps and the service port

Use torque wrench to tighten the service port cap to a torque of 18N.m.

Be sure to check for gas leakage.

5.3.4 Adding the refrigerant after running the system for many years



Procedure:

1). Connect the charge hose to the 3-way service port, open the 2-way valve and the 3-way valve.

Connect the charge hose to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder bottom up to ensure liquid charge.

2). Purge the air from the charge hose

Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).

3) Put the charging cylinder onto the electronic scale and record the weight.

4) Operate the air conditioner at the cooling mode.

5) Open the valves (Low side) on the charge set and charge the system with liquid refrigerant.

6).When the electronic scale displays the proper weight (refer to the gauge and the pressure of the low side), disconnect the charge hose from the 3-way valve's service port immediately and turn off the air conditioner before disconnecting the hose.

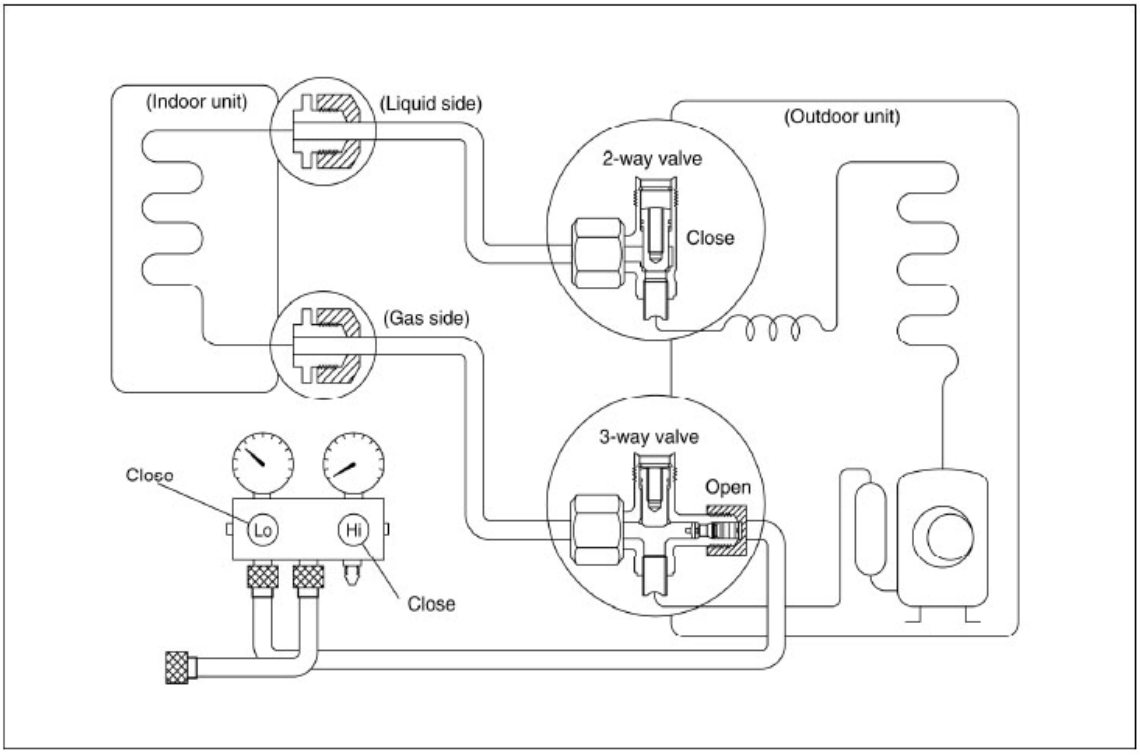
7). Mount the valve stem caps and the service port

Use torque wrench to tighten the service port cap to a torque of 18N.m.

Be sure to check for gas leakage.

5.3.5 Re-installation while the indoor unit need to be repaired

1. Collecting the refrigerant into the outdoor unit



Procedure

1). Confirm that both the 2-way and 3-way valves are set to the opened position.

Remove the valve stem caps and confirm that the valve stems are in the opened position.

Be sure to use a hexagonal wrench to operate the valve stems.

2). Connect the charge hose with the push pin of handle lo to the 3-way valves gas service port.

3). Air purging of the charge hose

Open the handle Lo valve of the manifold valve slightly to purge air from the charge hose for 5 seconds and then close it quickly.

4). Set the 2-way valve to the close position.

5). Operate the air conditioner at the cooling cycle and stop it when the gauge indicates 0.1MPa.

6). Set the 3-way valve to the closed position immediately

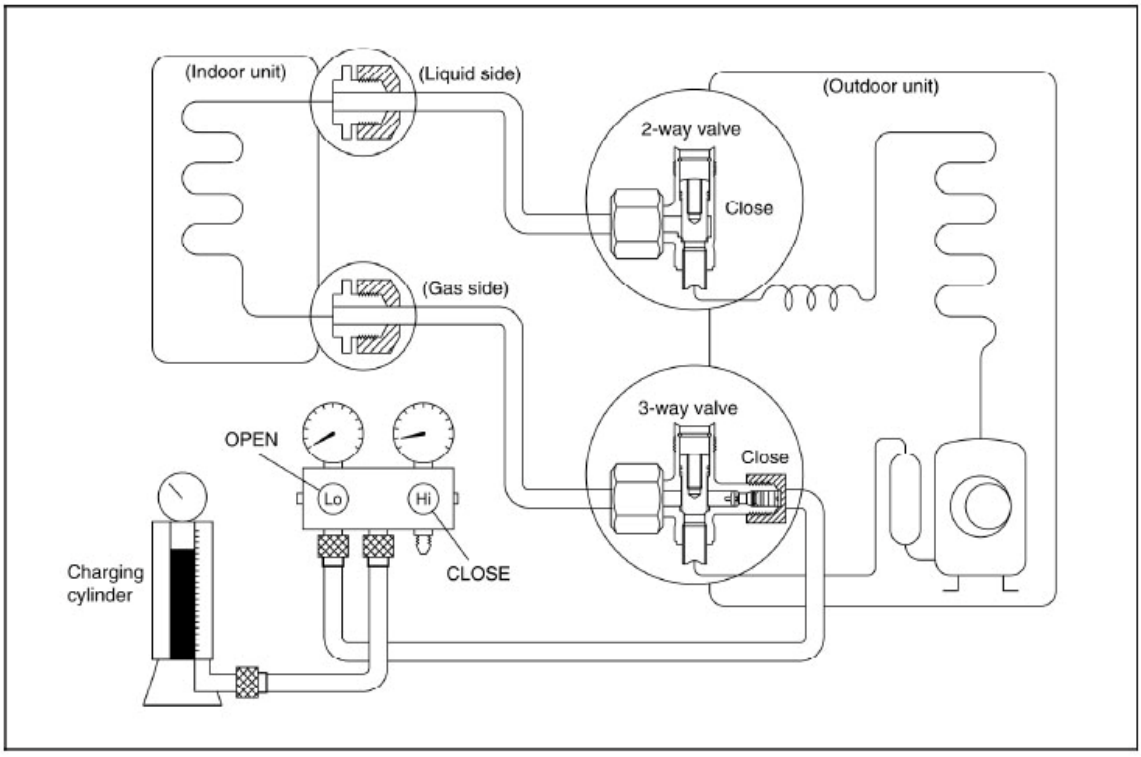
Do this quickly so that the gauge ends up indicating 0.3 to 0.5Mpa.

Disconnect the charge set, and tighten the 2-way and 3-way valve's stem nuts.

Use a torque wrench to tighten the 3-way valves service port cap to a torque of 1.8 kgf.m.

Be sure to check for gas leakage.

2. Air purging by the refrigerant



Procedure:

1). Confirm that both the 2-way and 3-way valves are set to the closed position.

2). Connect the charge set and a charging cylinder to the service port of the 3-way valve.

Leave the valve on the charging cylinder closed.

3). Air purging

Open the valves on the charging cylinder and the charge set. Purge the air by loosening the flare nut on the 2-way valve approximately 45' for 3 seconds then closing it for 1 minute; repeat 3 times.

After purging the air, use a torque wrench to tighten the flare nut on the 2-way valve.

4). Check the gas leakage

Check the flare connections for gas leakage.

5). Discharge the refrigerant

Close the valve on the charging cylinder and discharge the refrigerant by loosening the flare nut on the 2-way valve approximately 45’ until the gauge indicates 0.3 to 0.5 Mpa.

6). Disconnect the charge set and the charging cylinder, and set the 2-way and 3-way valves to the open position.

Be sure to use a hexagonal wrench to operate the valve stems.

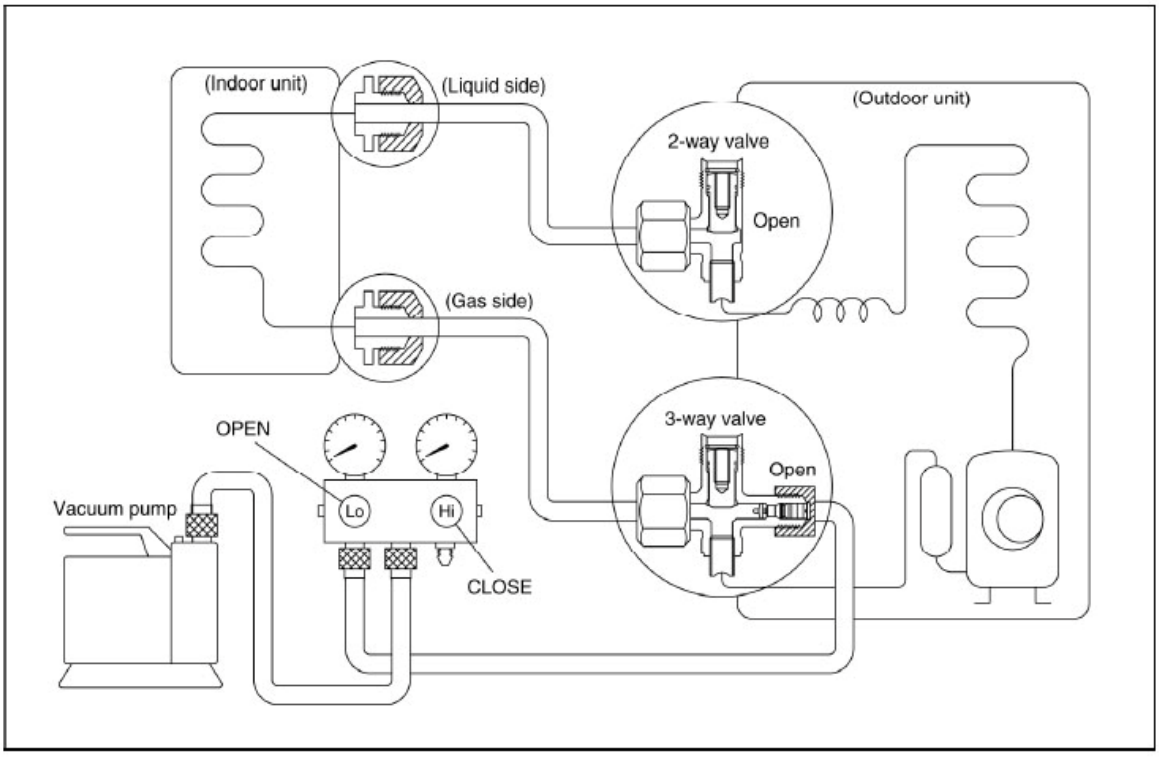
7). Mount the valve stems nuts and the service port cap.

Be sure to use a torque wrench to tighten the service port cap to a torque 18N.m.

Be sure to check the gas leakage.

5.3.6 Re-installation while the outdoor unit need to be repaired

1. Evacuation for the whole system



Procedure:

1). Confirm that both the 2-way and 3-way valves are set to the opened position.

2). Connect the vacuum pump to 3-way valve's service port.

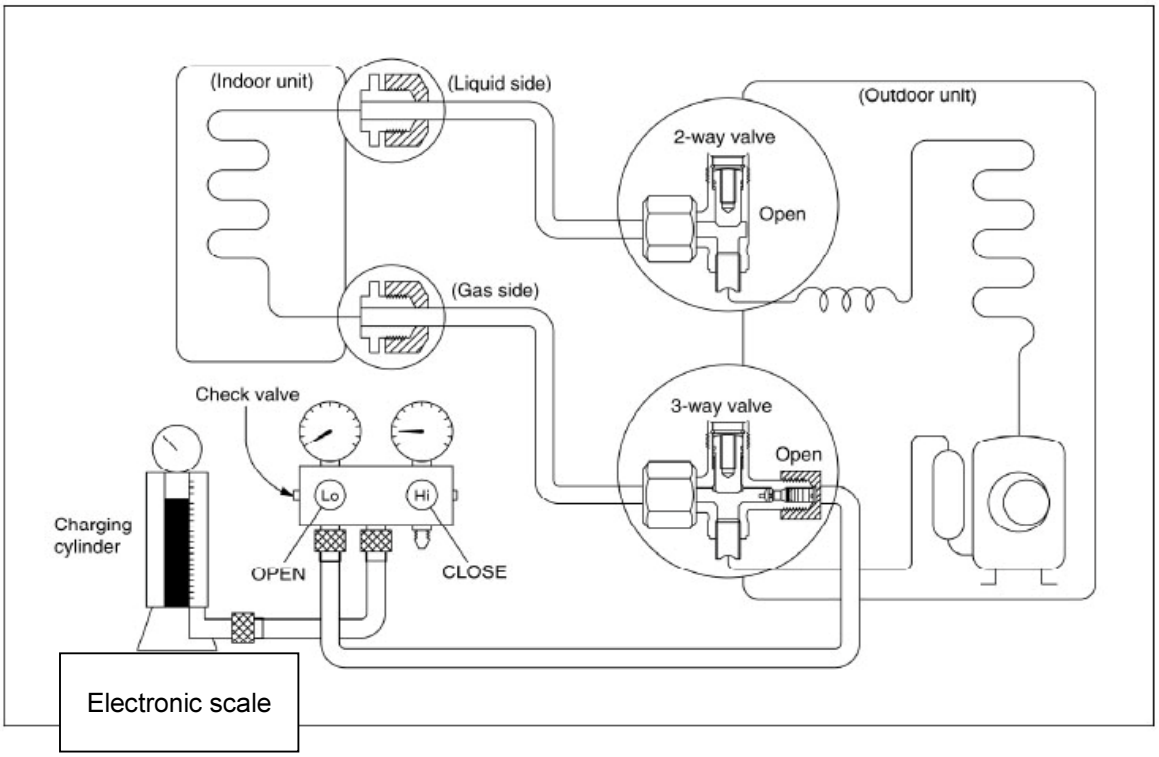
3). Evacuation for approximately one hour

Confirm that the compound meter indicates -0.1Mpa.

4). Close the valve (Low side) on the charge set, turn off the vacuum pump, and confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).

5). Disconnect the charge hose from the vacuum pump.

2. Refrigerant charging



Procedure:

1). Connect the charge hose to the charging cylinder, open the 2-way valve and the 3-way valve.

Connect the charge hose which you disconnected from the vacuum pump to the valve at the bottom of the cylinder. If the refrigerant is R410A, make the cylinder bottom up to ensure liquid charge.

2). Purge the air from the charge hose

Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air (be careful of the liquid refrigerant).

3) Put the charging cylinder onto the electronic scale and record the weight.

4). Open the valves (Low side) on the charge set and charge the system with liquid refrigerant.

If the system cannot be charge with the specified amount of refrigerant, or can be charged with a little at a time (approximately 150g each time) , operating the air conditioner in the

cooling cycle; however, one time is not sufficient, wait approximately 1 minute and then repeat the procedure.

5).When the electronic scale displays the proper weight, disconnect the charge hose from the 3-way valve's service port immediately.

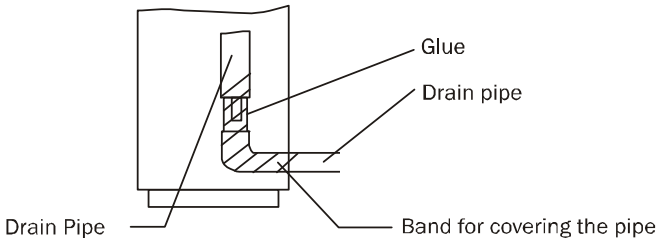
If the system has been charged with liquid refrigerant while operating the air conditioner, turn off the air conditioner before disconnecting the hose.

6). Mounted the valve stem caps and the service port

Use torque wrench to tighten the service port cap to a torque of 18N.m.

Be sure to check for gas leakage.

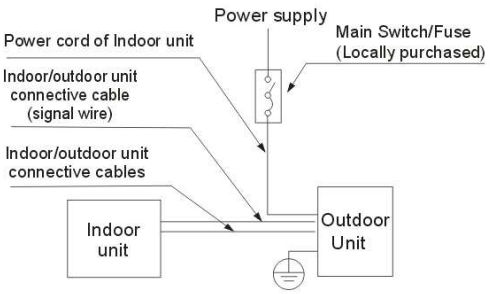
5.4 Drain Pipe of The Indoor Unit



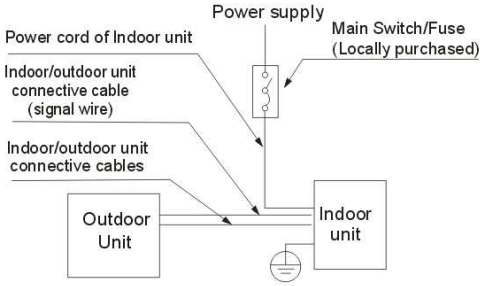
1. Make sure the drain pipe is connected to the outdoor side downward;
2.The hard polyvinyl chloride(PVC)plastic pipe (external diameter 26 mm) sold is the market is suitable for the attached soft drain pipe;
3.Please connect the Soft Drain Pipe with the Drain Pipe, then fix it with band;
4.If you have to connect the Drain Pipe indoors, to avoid condensing caused by air intake, you must cover the pipe with heat-insulation material (polyethylene with Specific Gravity of 0.03, at least 9 mm in thickness), and use Glue Band to fix it.
5.After the Drain Pipe has been connected, please check if the water drains out of the pipe efficiently and has no leakage.
6.Refrigerant pipe and Drainpipe should be heat-insulated to avoid condensing and water-dropping later on.

5.5 Wiring

Please refer to the Wiring Diagram.



(1)



(2)

Note: The power supply of the air conditioner is different according to the models. Please refer to the WIRING DIAGRAM pasted on the indoor and outdoor units before wire connection.

5.6 TEST RUN

Perform test operation after completing gas leak and electrical safety check. The test operation time should last more than 30 minutes.
1. Open the panel and lift the panel up to angle which remains fixed. Do not lift the panel

any further when it stops with a "click" sound.

2. Press the manual switch button twice until the operation indicator lights, the unit will operate on Manual Cool mode.
3. Check if all the functions works well while testing the air conditioner. Especially check whether the drainage of indoor unit is smooth or not.
4. Press the manual switch button again till the operation indicator turns dark after finishing the test operation and the unit stops operation.

6 · External view and display

6.1 External view

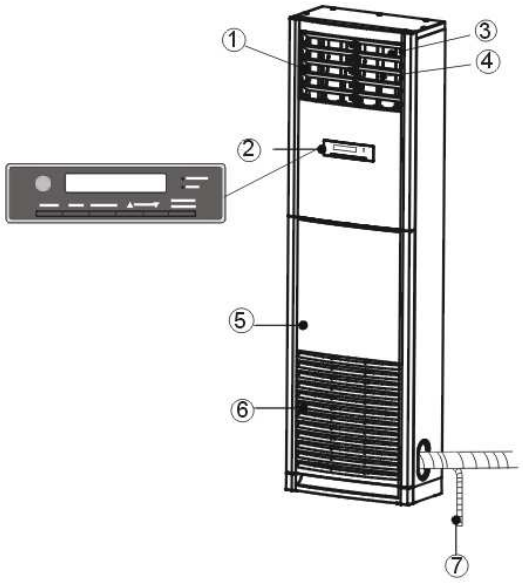
This unit consists of indoor unit and outdoor unit.

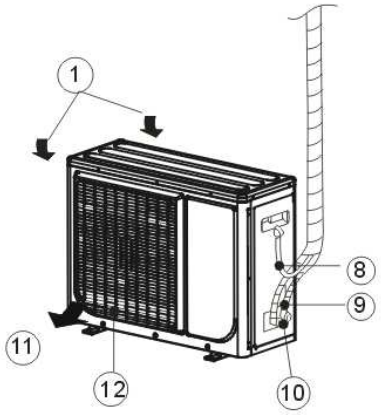
Indoor unit

① Air outlet
② Operation panel
③ Horizontal airflow control louver
④ Vertical airflow control louver
⑤ Front panel (upper and lower)
⑥ Air inlet
⑦ Drain pipe

Outdoor unit

⑧ Connection cable
⑨ Connection pipe
⑩ Cut-off valve
⑪ Air outlet
⑫ Fan hood



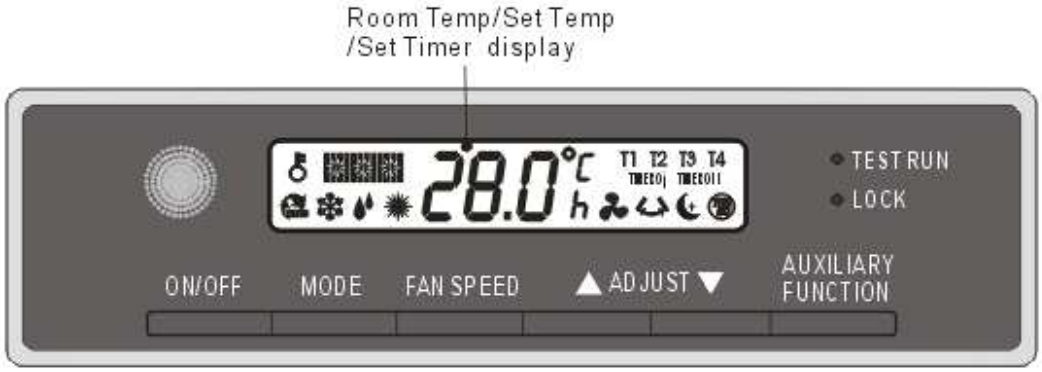


Note:
All the pictures in this manual are for explanation purpose only.
They may be slightly different from the air conditioner you purchased (depend on model).
The actual shape shall prevail.

6.2 CONTROL PANEL

Control Buttons and Functions

Unit Control Panel



Indicators

- Auto operation display
- Cooling operation display
- Dry operation display
- Heating operation display
- Fan operation display
- Swing operation display
- Sleep operation display
- Turbo operation display
- TIMER ON On timer operation display
- TIMER OFF Off timer operation display
- Lock operation display
- Fan speed display

7.Operation characteristics

Mode / Temperature	Cooling operation	Heating operation	Drying operation
Room temperature	≥17°C	≤30°C	>10°C
Outdoor temperature	5°C ~ 43°C (-15°C~ 43°C:For the models with low temperature cooling system)	-7°C ~ 24°C	5°C ~43°C

CAUTION:

1. If air conditioner is used outside of the above conditions, certain safety protection features may come into operation and cause the unit to function abnormally.

2. Room relative humidity less than 80%. If the air conditioner operates in excess of

this figure, the surface of the air conditioner may attract condensation. Please sets the vertical air flow louver to its maximum angle (vertically to the floor), and set HIGH fan mode.

3. Optimum performance will be achieved within this operating temperature.

8.Electronic function

8.1 Main data Introduction

Ts : Set temperature,
T1 : Room temperature
T2: Evaporator coil temperature
T3: Condenser coil temperature
T4: Outdoor ambient temperature

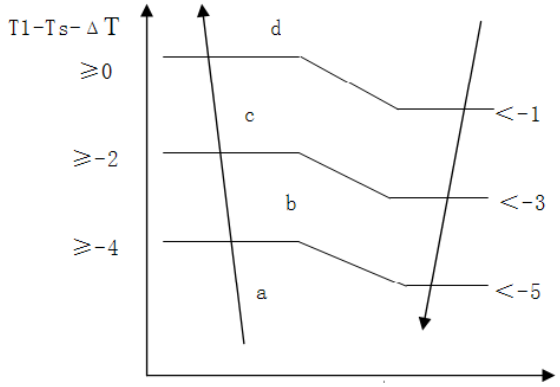
8.2 Operation Modes and Functions

8.2.1Manual Operation

8.2.2 Heating Mode

8.2.2.1 Four-way valve opens at once , while defrosting process closes.

8.2.2.2 After AC starts up, the PCB will calculate the capacity demand.



a	b	c	d
3	2	1	0

△T=3

Capacity demand=(a/b/c/d)×HP×△1×△2

△1 is the factor depending on the outdoor ambient temp.

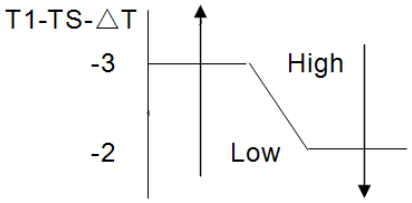
△2 is the factor depending on the evaporator coil temp.

According to the capacity demand, the compressor will run at the corresponding frequency.

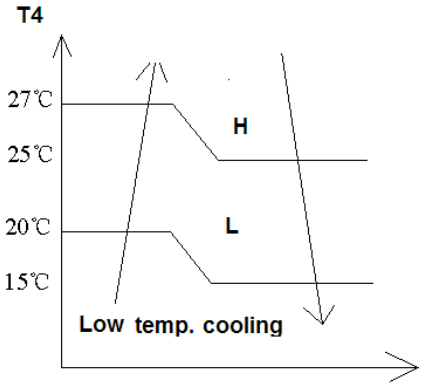
8.2.2.3 Indoor Fan Action

Anytime remote switchover for fan speed among high/low/auto, anti-cold air function takes priority.

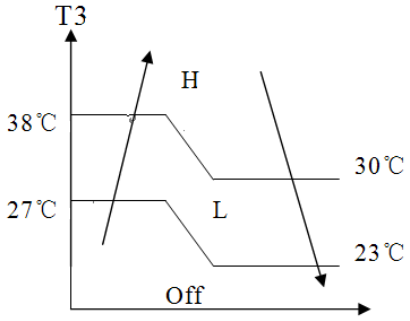
Auto fan in heating mode



8.2.2.4 Outdoor fan



In low temp. cooling zone, the outdoor fan will be controlled as below:



8.2.2.5 Anti-cold air:

When evaporator coil temp.T2 is getting higher,

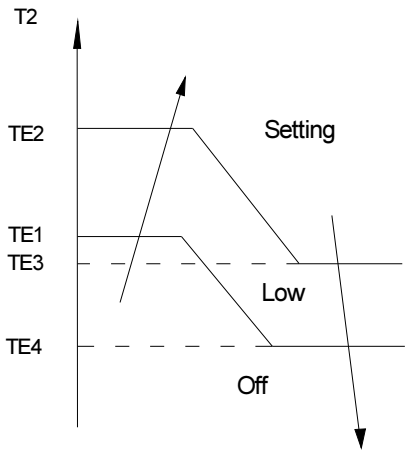
T2>TE2, the indoor fan will run at setting speed.

TE1<T2<TE2, the indoor fan will run at low speed.

When T2 is getting lower,

TE4<T2<TE3,the indoor fan will run at low speed.

T2<TE4, the indoor fan will shut off.



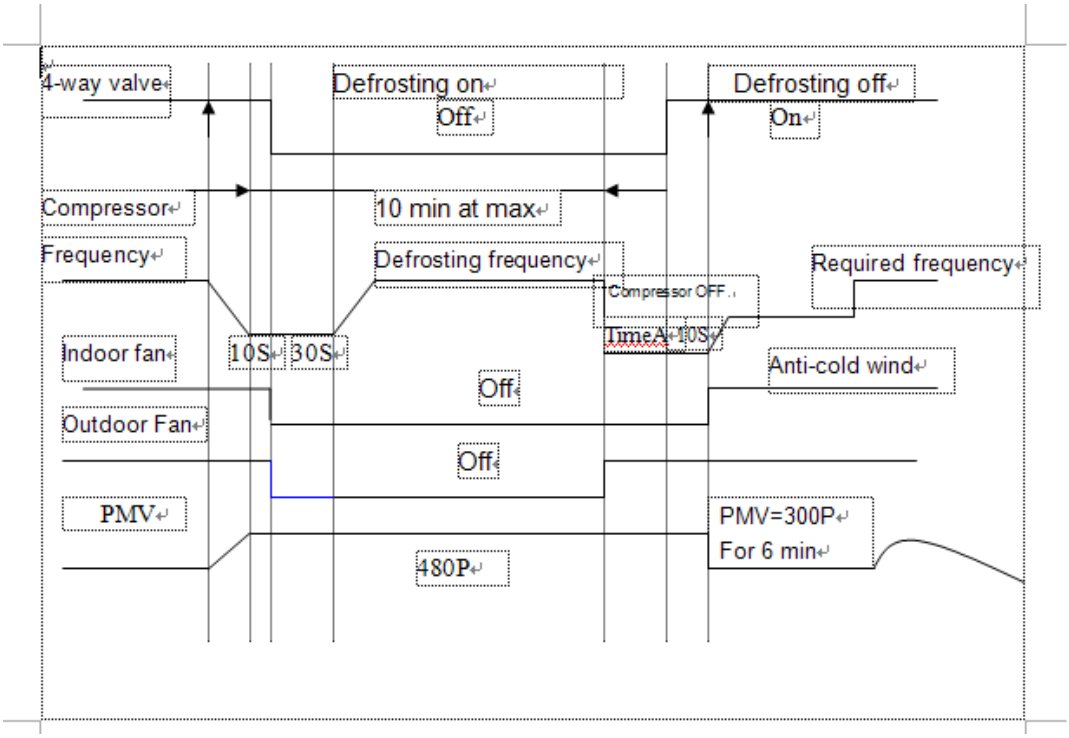
While TE1=30, TE2=35, TE3=32, TE4=26

8.2.3 Defrost (only available to heating mode)

8.2.3.1 **Condition of defrosting:**

The units run with T3＜-2℃ for 40 minutes

8.2.3.2 Defrosting Action:



8.2.3.3 Ending Of Defrosting Condition (Only if one of the following items is satisfied):

(1) Time of defrosting lasts 10 minutes.

(2) Temperature of outdoor coil T3 is up to 15°C.

(3) AC has changed to other modes or shut off.

8.2.3.4 PTC function

(1) Open conditions: (If all the following conditions are satisfied, the PTC will open)

¬ Indoor fan is on

¬ Compressor is on

¬ Indoor evaporator temperature T2 ≤40

¬ T1-3≤ TS-6 ℃

(2). Close conditions: (If one of the following conditions is satisfied, the PTC will close)

¬ T1-3>TS

¬ No capacity requirement

¬ compressor is off

¬ Indoor fan is off

¬ Indoor evaporator temperature T2 > 52

If the PTC opens, the indoor fan will be closed 15sec delay.

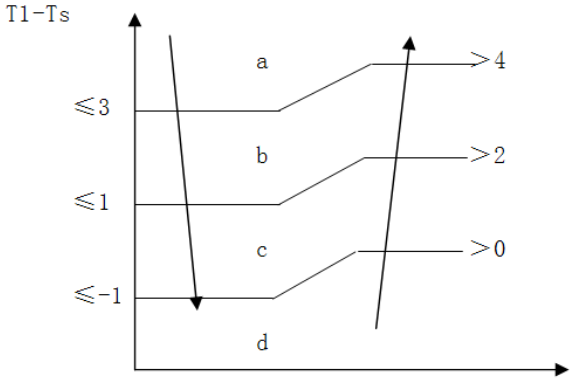
8.2.4 Cooling Mode

8.2.4.1 Four-way valve is closed.

If four-way valve is open before the machine enters cooling mode, then four-way valve will

be closed at the first time, the compressor starts under the cooling mode.

8.2.4.2 Conditions for the compressor and outdoor fan action (Ts = set temperature)



a	b	c	d
3	2	2	0

Capacity demand=(a/b/c/d)×HP×△1×△2

△1 is the factor depending on the outdoor ambient temp.

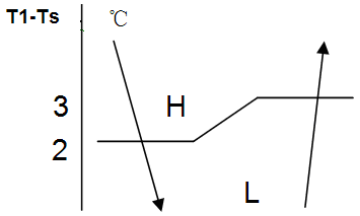
△2 is the factor depending on the evaporator coil outlet temp.

According to the capacity demand, the compressor will run at the corresponding frequency.

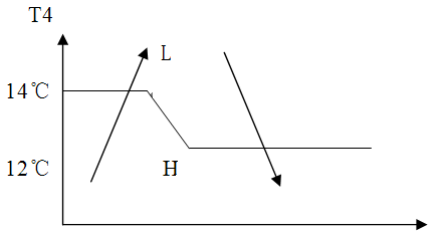
8.2.4.3 Action of Indoor Fan

HIGH/ LOW/AUTO fan can be switched over by your comfort.

Auto fan under cooling mode.



8.2.4.4 Outdoor Fan



8.2.5 Dehumidifying Mode

8.2.5.1 Indoor fan speed is low.

8.2.5.2 Four-way valve is closed,. the compressor and outdoor fan will operate the same as in cooling mode.

8.2.6 Auto Mode

When entering auto mode, the heating, fan only or cooling operation will be automatically chosen

according to the room temperature T1 and the set temperature Ts.

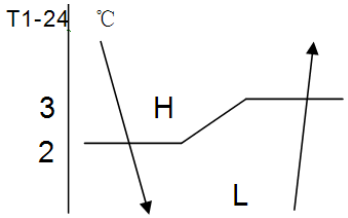
Condition	Mode
T1-Ts≥2°C	Cooling
-1°C≤ T1-Ts<2°C	Fan
T1-Ts<-1°C	Heating

8.2.7 Fan Only Mode

8.2.7.1 Temperature setting function is disabled, and no setting temperature is displayed.

8.2.7.2 Under this mode, four-way valve, compressor and outdoor fan are shut down.

8.2.7.3 High/Low/Auto fan can be switched over through manual control. Auto fan will be controlled in line with cooling auto fan with temperature set to be 24°C.



8.3 Other Functions

8.3.1 LCD display

Mode, Set temp. ,fan speed, time, timer, protection etc.

8.3.2 Timer

The machine should be provided with max. Interval of 24h and min. resolution ratio of 30 minutes.

9.Characteristic of temperature sensor

Temp.℃	Resistance KΩ	Temp.℃	Resistance KΩ	Temp.℃	Resistance KΩ
-10	62.2756	17	14.6181	44	4.3874
-9	58.7079	18	13.918	45	4.2126
-8	56.3694	19	13.2631	46	4.0459
-7	52.2438	20	12.6431	47	3.8867
-6	49.3161	21	12.0561	48	3.7348
-5	46.5725	22	11.5	49	3.5896
-4	44	23	10.9731	50	3.451
-3	41.5878	24	10.4736	51	3.3185
-2	39.8239	25	10	52	3.1918
-1	37.1988	26	9.5507	53	3.0707
0	35.2024	27	9.1245	54	2.959
1	33.3269	28	8.7198	55	2.8442
2	31.5635	29	8.3357	56	2.7382
3	29.9058	30	7.9708	57	2.6368
4	28.3459	31	7.6241	58	2.5397
5	26.8778	32	7.2946	59	2.4468
6	25.4954	33	6.9814	60	2.3577
7	24.1932	34	6.6835	61	2.2725
8	22.5662	35	6.4002	62	2.1907
9	21.8094	36	6.1306	63	2.1124
10	20.7184	37	5.8736	64	2.0373
11	19.6891	38	5.6296	65	1.9653
12	18.7177	39	5.3969	66	1.8963
13	17.8005	40	5.1752	67	1.83
14	16.9341	41	4.9639	68	1.7665
15	16.1156	42	4.7625	69	1.7055
16	15.3418	43	4.5705	70	1.6469

10.Trouble shooting

10.1 Protective Function

10.1.1 3-minute delay for the compressor start-up

10.1.2 Evaporator protection against high temperature

10.1.2.1 Only available under heating mode.

10.1.2.2 The operation principle is as follows: (T2 = evaporator temperature)

Condition	Outdoor fan	Compressor
Evaporator temp.≥60° C（last 3 seconds）	Off	Off
Evaporator temp.<54°C	On	On

10.1.3 Evaporator Protection against low temperature

10.1.3.1 Only available under cooling and dehumidifying status.

10.1.3.2 Protection principle:

Condition	Outdoor fan	Compressor
T2≤2° C（last 3 minutes）	Off	Off
T2≥7° C	On	On

10.1.3.3 The restart of the compressor shall execute the delay protection.

10.1.4 Condenser high temperature protection

10.1.4.1 Only available to cooling and dehumidifying mode.

10.1.4.2 Action condition

Condition	Outdoor fan	Compressor
Condenser temp.≥65° C（last 3 seconds）	Off	Off
Condenser temp.<52°C	On	On

10.1.4.3 Delay protection should be performed when the compressor restarts.

10.1.5 Outdoor protection

When outdoor protection signal is high level(last 4 seconds), outdoor unit will perform protection: the whole machine will be shut down while the indoor unit will indicate the corresponding protection signal(Ed).

The A/C will recover if outdoor errors are eliminated after the outdoor protection occurs.

10.2 Self-diagnosis

Codes	Contents
P0	Evaporator low temp. protection
P1	Defrosting or anti-cold air
Ed	Outdoor unit protection /outdoor temp. sensor is circuit or short circuit
E1	Communication protection between indoor and outdoor units
E2	Temp. sensor T1 is open circuit or short circuit
E3	Temp. sensor T2 is open circuit or short circuit
E4	Temp. sensor T2B is open circuit or short circuit
E7	EEPROM chip malfunction

10.3 Troubles and Solutions

Before calling for service, please review the following list of common problems and solutions.

Problem	Possible Cause	Solutions
Air conditioner does not operate at all	Power failure	Wait for power restoring
	The power supply is disconnected.	Switch on the main power switch
	The power fuse is blown.	Change the fuse
	The timer is set.	Wait or cancel timer setting
	The batteries of the remote control are exhausted	Change the batteries.
Air conditioner does not cool or heat well	The temperature setting is too high or too low.	Set a more comfortable temperature.
	The air filter is clogged with dust	Clean the filter
	The air inlet or outlet of the outdoor unit is blocked	Clear up the block
	Doors or windows are open	Close the doors or windows
Air conditioner does not cool or heat at all	The air inlet or outlet of the outdoor unit is blocked	Clear up the block first, then begin to operate.
	Three-minute protection feature	Wait for a while
	The temperature setting is not appropriated	Set the temperature properly

If you still cannot solve the problem after trying the above, pull out the power plug and call the dealer.

The following displays indicate an error or problem(24K):

Number	Display code	Problems	What to do
1	E1 E2 E3 E4	Temperature Sensor is off or short-circuit.	Contact service people
2	Ed	Outdoor unit protection /outdoor temp. sensor is circuit or short circuit	Contact service people
3	P0	The temperature of the evaporator of indoor unit is too low (For the protection feature, the compressor turns off automatically)	The temperature of the evaporator of indoor unit is too low (For the protection feature, the compressor turns off automatically)
4	E7	EEPROM chip malfunction	Contact service people
5	P1	Defrosting or anti-cold air	The unit will auto restart after finishing the defrosting or the temperature of the Heat Exchanger of indoor unit raise.

CAUTION:

When the power cord is to be replaced, replacement work shall be performed by authorized personnel only.